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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • NOVEMBER 13, 1943

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DETROIT

Tank Ambulance

See Page 313

A SCIENCE SERVICE PUBLICATION

Do You Know?

Food prices in Palestine have increased more than 150% since 1939.

The expression "a round of *ammunition*" came into use perhaps because early bullets were round in shape.

The marine *black-sand* deposits of Coos County, Ore., are now yielding chromium concentrates by magnetic separation.

The largest terrapin *hatchery* in the world, a Federal hatchery at Beaufort, N. C., has produced nearly 200,000 diamond-backs for restocking purposes.

In two years since the first transatlantic *air-express* was inaugurated, over 2,000 tons of express have been transported between Europe and the United States.

The Hawaiian *goose*, or nene, is now known to exist only on the Island of Hawaii; for the past five years the nene population there has been estimated at only 50 wild birds.

Penicillin, the most promising, medically, of all anti-bacterial products so far discovered, is a strong acid soluble in water and freely soluble in ether, alcohol, acetone and ethyl acetate.

Basic English, which uses 846 of the more common English words, is easily learned by non-English speaking people; it includes 600 nouns, 150 adjectives, 18 verbs, and 78 pronouns, adverbs and prepositions.

Pellagra, now known to be induced by nutritional deficiency, was first described in 1735 by a Spanish physician; its name, first applied to it in 1771, is from two Italian words meaning "skin" and "rough."

Life jackets for men fallen into the sea sometimes have attached packages of dye; the dye when released spreads a fluorescent yellowish green 25-foot spot around the men which can be seen from airplanes high in the air.

Cranberry pulp and seed, waste products in cranberry jam plants, is found to yield ursolic acid, an excellent emulsifying agent, as well as cranberry wax and cranberry seed oil; all have commercial uses.

Tailless African macaques, or Barbary *apes*, on the Rock of Gibraltar receive excellent care as certain British soldiers are said to believe that "as long as the apes remain the British will hold the Rock."

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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NUTRITION

Folic Acid and Blood Cells

Discovery links new B vitamin with the production of white corpuscles. Acid cures blood disorders in rats caused by sulfa drug.

➤ A DISCOVERY linking a new B vitamin, folic acid, with blood cell production in the body has been made at the National Institute of Health. This is the first time a vitamin has been linked with white blood cell production, although a relation between vitamins and red cell production has been hinted by two or three previous reports.

Folic acid will cure the anemia and white blood cell destruction caused in rats by sulfa drugs, Dr. Floyd S. Daft and Dr. W. H. Sebrell, U. S. Public Health Service, report. (*Public Health Reports,* Oct. 15)

Sulfa drugs sometimes cause the same white blood cell destruction, called leukopenia and granulocytopenia, and anemia in human patients. The first practical result of the discovery, therefore, will probably be greater safety in sulfa drug treatment.

White blood cell destruction, or a condition in which there are too few of these cells, however, occurs also in patients who have not been getting sulfa drugs. Some of these cases have been attributed to other chemicals, such as those used in formerly popular headache remedies. In other cases no cause for the condition could be found. The findings on the rats suggest pretty strongly that in all such cases the underlying cause may have been a diet deficient in the folic acid vitamin.

Whether this vitamin plays as important a part in blood cell production as vitamin D plays in bone formation remains for future studies to determine. Folic acid was first introduced to the world under that name by Dr. Roger J. Williams at the University of Texas in 1941, but its only significance heretofore known was the cure of anemia in chickens. It is a member of the vitamin B group and is found more abundantly in liver, kidney, yeast and immature grass than in other materials analyzed, according to a report from John Bowden, E. B. McQuarrie and W. H. Peterson, of the University of Wisconsin. It got its name from the same Latin word that gives us the word "foliage," because it was found abundantly in leaves.

Prof. C. A. Elvehjem and associates at the University of Wisconsin have also found that, although rats can thrive on a diet lacking both folic acid and another B vitamin, biotin, they stop growing and get sick when given a sulfa drug while on such a diet. The ill effects of the sulfa drug, they reported, could be both prevented and cured by adding folic acid and biotin to the diet. Without the sulfa drug, the bacteria in the rat intestine presumably manufacture enough of these vitamins for the animal's requirements.

Dr. Daft and Dr. Sebrell were able to pin the blood disorders in rats definitely to lack of folic acid because they were able to use pure folic acid, instead of a vitamin concentrate, for curing the disorders. This material, which has only been isolated in the past few months, was furnished them by Dr. A. D. Emmett of Parke, Davis and Co., and Dr. E. L. R. Stokstad, Dr. B. L. Hutchings and Dr. N. Bohonos of Lederle Laboratories, Inc.

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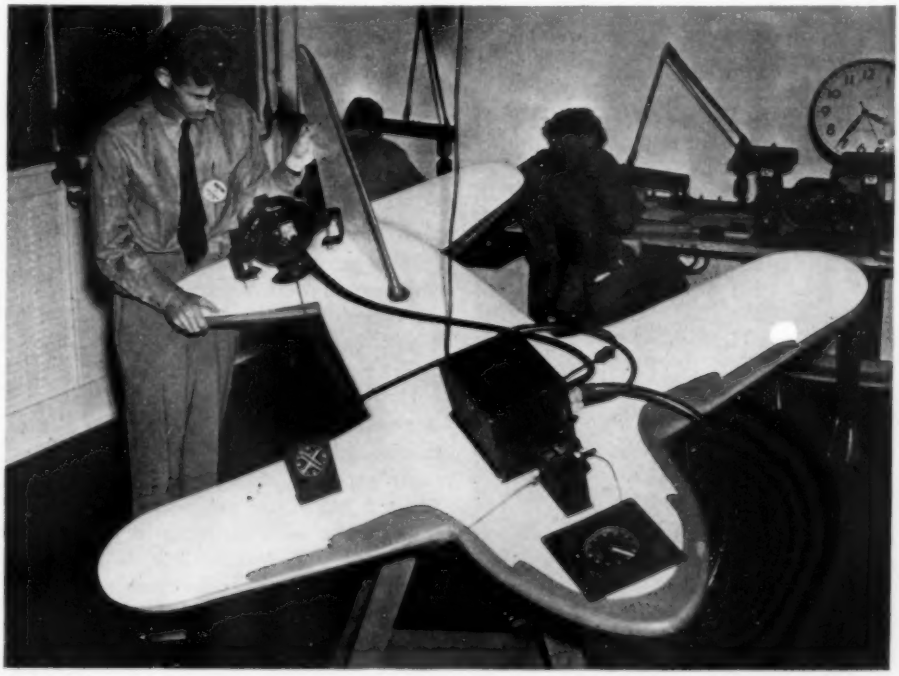

REVOLUTIONARY—It is rare that a new type of compass is developed. This one, in production for the Army and Navy at the Philadelphia division of the Bendix Aviation Corporation, is not thrown off by metal nearby (See SNL, Oct. 23). The compass transmitter is shown at upper left, on the tail of a model plane; the amplifier on the center of the "fuselage"; the master indicator on the plane's "nose" and a secondary indicator on the wing at left.

NUTRITION

Pet Dog May Give Clue To Family's Diet Illness

➤DIAGNOSE my dog, diagnose me, may become the new scientific version of the old saying, Love me, love my dog.

In at least one instance, signs of hidden hunger in a dog eating scraps from the family table led to better understanding of why all the members of the family, though not actually sick, were complaining of weakness, nervousness, irritability and loss of appetite, Dr. Tom D. Spies, of Hillman Hospital and the University of Cincinnati, reports. (*Science,* Oct. 22)

The family's vague symptoms, it turned out, were due to hidden hunger from lack of vitamins. The pet dog which lived on the same diet showed the symptoms more clearly.

Lack of two B vitamins, riboflavin and niacin, may both be detected in dogs eating scraps from the family table, Dr. Spies reports. The niacin lack, it has long been known, leads to pellagra in

the family and to black-tongue in the dogs. Lately Dr. Spies has noticed in pet dogs the same eye symptoms of riboflavin deficiency that appear in humans whose diet lacks this vitamin. As in humans, the condition in dogs can be rapidly cured by doses of riboflavin and can be prevented by proper diet.

Since marked symptoms of pellagra and riboflavin deficiency usually do not appear in people until after they have been on poor diets for some time and have for months or years been weak, listless and vaguely ill, examination of the family's pet dog may in future be added to other diagnostic tests for human illnesses.

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ARCHAEOLOGY

Prehistoric Baths

Discovery of archaeological expedition in Colombia reveals that Indians had advantages of running water and artistic decoration.

➤ COMPLETE with running water facilities, three bathtubs hewn from a rocky slope approximately 2,000 years ago in the San Agustin region of Colombia, South America, may be the key to a prehistoric civilization. Unearthed during an archaeological expedition six years ago sponsored by the Colombian government, this treasure was described for the first time in this country in an exclusive interview by one of the explorers, Dr. Gregorio Hernandez de Alba, director of the National Archaeological Museum of Colombia.

The three prehistoric baths, Dr. de Alba explained, cause scientists to wonder whether this is proof that modern Indian tradition is actually a carry-over from as far back as 500 B. C.

Bathing is symbolic of purification in modern Indian culture, he explained. Before a tribal mother who has borne a child can return to her family, both she and the baby must bathe in a nearby creek. After a burial, all members of the mourning party, fully clothed, must splash around in the creek, ridding themselves of evil spirits. Any Colombian Indian upon seeing a rainbow in the sky must immediately rush to the creek and, fully clothed, wash the devil away.

That this modern custom has been derived from ancient tradition has long been the archaeologist's theory. The remains of the prehistoric baths give tangible evidence to such reasoning.

The baths are approximately nine feet long, four feet wide, and from one to three feet deep. Variation in depth occurs because the baths face across the slope; one nine-foot side being three feet deep, the other being only one foot deep, allowing a steady stream of water to flow across the bather and out of the bath.

No pipes or tubing were required for the running water arrangement. But the prehistoric plumbers showed great skill in their plans. The main stream on the slope was diverted into a series of little canals headed downstream, providing a continuous water supply.

Elaborate carvings were found on all sides of the tubs. Water animals such as snakes, lizards and frogs predominate, all facing inward. There are also human heads, Indian figurines and monkeys. High on the hill overlooking the baths is a seat hewn from the slope. On the left side of this seat is carved a human arm, and on the lower part are carved two human feet. On these carvings the chief or ruler or priest rested his arm and legs while he presided over the ceremony.

"Customs and traditions associated with these ancient remains are buried in the past," says Dr. de Alba. "We can only guess that the elaborately carved baths had religious implications. But from the ingenious canals diverted from the main stream to create a gentle and continuous water flow, it is easy to surmise that we have here represented a high plane of ancient culture."

A wearisome 16-day mule trek for early expeditionary parties from Bogota, the capital of Colombia, the 560-mile trip to San Agustin now takes two days by train or auto.

Dr. de Alba was invited to come to this country by the Committee of Artistic and Intellectual Relations of the Coordinator of Inter-American Affairs to make a report on the manners and customs of the Indians living in the Andes in southern Colombia. He is also preparing a survey of the archaeology of this area for the Institute of Andean Research, a research organization composed of scientists interested in the anthropological problems of the Andean and adjacent areas. While in this country, Dr. de Alba has been commissioned by the Secretary of Education of Colombia to study the organization of our anthropological museums.

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ANCIENT INDIAN BATHTUB—Using an ingenious arrangement of canals, the prehistoric plumber designed these 2000-year-old tubs complete with running water facilities. Hewn from the bedrock of a stream, the elaborate carvings on the bath are symbols of an ancient culture.

MILITARY SCIENCE

USES Advises on Deferment

Draft boards must consult local employment office before inducting any man who is alleged to be in a critical war occupation.

➤ DEFERMENT of military service for physicists, chemists, engineers and other men in critical war occupations is now up to the U. S. Employment Service, not solely to the local draft board.

Latest directive of the National Headquarters, Selective Service System, requires local boards, whenever they decide that a man alleged to be in a critical occupation is not entitled to occupational deferment, to refer the case to the local office of the USES.

Then, within 30 days, USES must decide whether the man is actually fully employing his qualifications in a critical occupation in the war effort. If he is not, but is qualified to do so, it is then up to USES to get him a job where he will use his talents in some essential job.

If USES certifies to the local draft board that the man was in a critical job or that they have placed him in one, then the draft board is required to consider this new evidence as basis for deferment. If the 30 days go by and the USES fails to certify that he is essential in a civilian occupation, then the draft board may go ahead with the induction.

Meanwhile, the War Manpower Commission has notified local offices of USES of the importance of expediting all such requests from the local draft boards. In the case of scientists and other professional men, they are urged to consult the National Roster of Scientific and Specialized Personnel. The occupations listed as "critical" are those which in the judgment of the War Manpower Commission can not have any substantial number withdrawn from them without serious shortages resulting.

"It is imperative," Director Lewis B. Hershey said, "that registrants engaged in critical occupations in war production or in support of the war effort should be given grave consideration for occupational deferment by the agencies of the Selective Service System. Administrative action will be taken to insure such consideration by the Selective Service System."

In case a professionally qualified employee considered to be working in an essential activity is kept in Class 1-A and scheduled for induction by his local board after the matter has been referred to the USES, the individual or his employer is urged by Dr. Leonard Carmichael, director of the National Roster, to let the Roster know immediately, giving the registrant's name, address, local Selective Service board address, order number, name and address of employer, description of present job, and Roster registration number.

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PHYSICS

New Microscope

Instrument which permits examination of objects by their own shortlived glow after ultraviolet irradiation, opens new field to research.

➤ A NEW KIND of microscope, that promises to open up new fields for exploration in biology and mineralogy, has been devised by Dr. E. Newton Harvey and Dr. Aurin M. Chase of Princeton University. It is called the phosphorescence microscope because it makes use of the short-lived phosphorescent glow given off by many substances just after they have been exposed to the action of ultraviolet radiation.

That many things shine in the dark with peculiarly-colored visible light when invisible ultraviolet rays strike them is a well-known phenomenon. This light is called fluorescence; and it has been much used in research during recent years. Special fluorescence microscopes have been devised to aid in this work.

When the ultraviolet irradiation stops, fluorescence stops with it. However, it has frequently been noticed that some of the irradiated substances keep on glowing briefly after the ultraviolet lamp has been turned off. This glow, in many cases lasting for only a fraction of a second, has been termed phosphorescence. Among the substances showing this property are human teeth, wool, coral, dried potato and several other materials of both animal and plant origin.

Because of the short duration of this phosphorescence, ordinary microscopic observation has not been possible. Drs. Harvey and Chase, however, thought of the expedient of getting a large number of intermittent flashes, so close together that they appear to merge into one continuous illumination, like the rapidly succeeding "frames" of a motion picture.

Several different means for achieving this end have been devised. In some, the ultraviolet ray source is an intermittent spark, with a rotating shutter shielding the object-lens of the microscope while it is "on" and opening it for the passage of the phosphorescent flash when the spark is "off." Simpler, however, is a continuous source of ultraviolet with a double rotating shutter having staggered openings that alternately admit the ultraviolet rays and open the path for the phosphorescent light to the lens.

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MEDICINE

Sex of Twins in Doubt; Case Rare in History

➤ THE QUESTION, Is it a boy or a girl? can not yet be answered for two babies of New York City, although they were born nearly a year ago. The babies are identical twins. Their strange case is reported by Dr. Adrian Rhodes, of the department of pediatrics, New York Medical College, Flower and Fifth Avenue Hospitals. (*Archives of Pediatrics*, October)

The babies were thought to be girls when they were born. One of them was brought to the Flower-Fifth Avenue Hospital, when seven weeks old, because of a bad cold and intestinal disturbance. At first glance, the infant was again considered a girl but further examination showed that it was a pseudohermaphrodite. The other twin was sent for and found to have exactly the same condition.

Hermaphroditism is a condition in which sex organs of both sexes are found in one individual. The word comes from the old Greek myth about the child of Hermes and Aphrodite whose name was Hermaphrodite. Pseudohermaphroditism

is a condition in which the sex of the individual is in doubt.

The condition is rare in twins. Only eight previous cases in twins have been reported in medical history, and of these six were either born dead or died in early infancy. From their external appearances, Dr. Rhodes believes the twins he reports are male pseudohermaphrodites. When they are older, further examinations will be made to find their sex.

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RESOURCES

Critical Coal Shortage

Low temperatures may prevail in homes in many sections of the country this year due to the lack of sufficient fuels of all types.

➤ RESERVE COAL stockpiles are reported low in various sections and low temperatures may result in many homes this winter unless increased production and shipments meet the daily needs. Even the quota allowed to retailers by government officials, 90% of last year's supply, may not be available in certain communities.

The reason is a coal shortage which will probably grow worse as the activities incident to war continue to expand, unless production can be increased. For a substantial period the production has fallen below the level of national requirements.

The best proof of this statement rests in the fact that in the period from Jan. 1 to Sept. 1 of this year, consumers' stockpiles of bituminous coal were reduced from 85,889,000 tons to 75,292,000 tons. Production in that period lacked 10,597,000 tons of equalling requirements, and the difference had to be made up from reserves.

That is only half the story. During the same period last year stockpiles were increased by nearly 20,000,000 tons as protection against future requirements. This year, instead of building up reserves, production did not meet current needs and consumers were forced to burn stockpiles.

In September, 1942, it was estimated by the Federal Solid Fuels Administrator that 600,000,000 tons would be needed for 1943. Consumption so far shows this estimate to be close to the mark. Production as of Oct. 1 was a little less than 445,000,000 tons. Even without strikes it would be a practical impossibility to reach the 600,000,000 goal now.

The anthracite situation is even worse than the bituminous coal situation. It was estimated at the beginning of the year that 65,000,000 tons would have to be mined to meet all requirements. This is an increase of 10% over the production of the previous year. Actual increased production to date is less than 1%.

Anthracite is the number one household fuel in the North Middle Atlantic States, and large quantities are used in New England although fuel oil was the most used fuel there in normal times. New England now is reported to be in a bad situation, with many communities whose local stockpiles are exhausted.

The price factor does not enter into the present coal situation to any considerable extent. Ceiling prices established by OPA permitted an increase of about 25c a ton for bituminous coal and 50c for anthracite to meet mining adjustments.

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AERONAUTICS

Air "Freight Trains"

Post-war planes, using glider pick-up service, will make safe, speedy and cheap delivery of cargo. This type of service is now out of the stunt class.

➤ IT COSTS less per pound to ship your wife by air from Washington to Mexico City than a pair of shoes, and the shoe package needs only a pair of legs to get it on and off the plane, while your wife demands attentive service, a comfortable seat, air conditioning, the latest magazines and meals.

Air "freight trains," employing glider pick-up service, to come after the war will change this cargo picture, Grover Loening, consultant on aircraft for the WPB, reported to the Institute of Aeronautical Sciences meeting in Washington. He emphasized the tremendous commercial aspects of the glider pick-up air train. Developments initiated by the late Richard Du Pont and use by the Army Air Forces have greatly accelerated the progress in this field. Though just beginning, this type of service is now out of the stunt class and into the practical, Mr. Loening stated.

Using the hypothetical example of an air trip between New York and Washington, Mr. Loening pointed out that a glider train carrying cargo designated for intermediate stops on the run, could unload and pick up new cargo without losing valuable time by stopping to land and could make the complete trip in 81 minutes with an average rate of speed of 168 miles per hour.

The same trip, using a present-type cargo plane without a trailer, would take 168 minutes with an average rate of speed of 82 miles per hour due to the frequent stops for loading and unloading. On the same trip by glider train, non-stop passengers bound for Washington would be placed in the tug, or powered, plane.

These air freight cars, Mr. Loening explained, will not be strung out in a single line behind the tug plane, but will be fanned out on different length cables to prevent any chance of collision. They will not be the clumsy, box-car shape that the word "freight car" brings to mind, but will be the ultimate in stream-lining to eliminate all surface drag.

It is generally assumed at this time that having more than three gliders in the train is impractical.

Advantages of such a system of glider pick-up air trains, as pointed out by Mr. Loening, will be the time saved in cargo handling; the lower freight cost for air cargo; the many points along a route served without stopping to land; the use of shorter runways already in existence as a glider needs less length to land; the lack of vibration in a glider carrier, which will permit the fast and safe shipping of perishables; less fire and crash risk as the gliders carry no engines, so if something should go wrong with one of three gliders, this glider could be automatically released and 75% of the load

—two gliders and the tug—could be saved.

Disadvantages of this system which exist at present must be met by the designers, Mr. Loening pointed out. No aircraft as yet has been specifically designed as the tug plane. Problems are those relating to lowering fuel and engine power requirements for the tug and still getting the glider off the ground; desirable weight and load for glider to facilitate picking up and insuring against too fast a landing; resistance to tow lines; and more crew cost as each glider requires a pilot until such time as radio and electronics developments permit automatic control from the tug plane to pick up and release a glider.

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PUBLIC HEALTH

Health of Armed Forces

Members of the services of the United States, including WACS, WAVES, and SPARS, are in excellent health. Malaria, dysentery are chief Army problems.

➤ MEMBERS of the armed forces quartered in the United States and the WACS, WAVES and SPARS are in excellent health, the Office of War Information reports on the basis of a survey of service records.

Overseas, the health record is also excellent. Malaria and dysenteries are the chief problems in land combat conditions. The Navy has had some trouble with infectious jaundice and with filariasis, the tropical disease which, when it becomes chronic, leads to elephantiasis. Fewer than seven cases per 100,000 men in the Navy, however, have been infected with this parasitic disease which is spread by mosquitos. No mention of any of these cases of filariasis having progressed to the elephantiasis stage appears in the OWI report.

Our armed forces overseas are better off so far as malaria is concerned than those of our enemies or any other armies operating in the same theaters as our Army, Army and Navy officials believe. The Army's malaria rate for overseas units in 1942 was about 30 per 1,000 men and so far in 1943 the annual rate is about 80 per 1,000. This increase is because of increased war activity in malaria areas. The Japanese, it is stated, failed to make adequate preparations against malaria, and consequently their troops are suffering from it much more acutely than ours.

Sickness or non-battle injuries kept an average of slightly more than 3% of the Army personnel in this country off duty at any given time during 1942. Abroad, the rate, even including battle casualties, was slightly lower. The Navy's corresponding "non-effective" rate was about 2% in 1942, also a record low. For 1943, Army figures show a continuation of the good health picture.

Venereal diseases in the Army and Navy are being held to low figures. In the United States, the Army's rate for men treated this year stands at about 40 per 1,000 men per year. The Navy's rate is 33 per 1,000.

"In this class of diseases there is a wide divergence," OWI states, "between the major branches and the women's services. Fewer than one in 10,000 women in the uniformed services has been admitted to treatment for venereal diseases.

"Of some 1,100 WACS released for disability in a 10-month period, only one was discharged because of syphilis and only one because of gonorrhea."

About 25% of the WACS released for disability were released because of defects or ailments peculiar to women. About 45% were released for neuropsychiatric disorders, but many of these disorders, it was stated, would probably not be considered abnormal in civilian life. Separate health records are not kept for WAVES and SPARS but it is stated their health problems, except for venereal diseases, are much the same as those for the men.

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MILITARY SCIENCE-ETYMOLOGY

Do You Know a Fuse from a Fuze?

➤ FUSE OR FUZE? We were all confused too. It seems that the Army's Ordnance Division uses "fuse" for a device that times the explosion of a projectile by means of a powder train; "fuze" for a purely mechanical device to set off the big bang. Despite confusion, Science Services refuses to depart from this Army usage.

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ORDNANCE

Fuzes on 20-Pound Bombs Tested in New Wind Tunnel

➤ FUZES for 20-pound fragmentation bombs are now tested in three-foot tunnels with gales of from 300 to 800 miles an hour to simulate wind currents encountered by falling bombs. The tunnels are in use at the Westinghouse Appliance Division plant at East Springfield, Mass.

The bombs in which these fuzes are used explode and scatter fragments upon striking the earth. Premature explosion is prevented by the timing fuze which has a bow-like vane on its tip that revolves as the bomb falls. After a predetermined number of revolutions it loosens a safety device, which in turn releases the firing pin to strike explosive portions of the bomb when it hits the earth.

To test a fuze in the new tunnel, it is placed in the path of compressed air fired from a cylindrical tank. The air when released whirls the vane and releases the safety device. The action is recorded by a beam of light on a photoelectric cell, released as the safety device falls off.

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TESTING BOMB FUZE—A fuze for a 20-pound fragmentation bomb is being installed in the path of a man-made gale to determine how the fuze would perform when dropped by an American airman. Wind tunnel tests such as this at the Westinghouse East Springfield plant provide a constant check on the quality of fuzes produced.

METALLURGY

New Penny Will Contain Less Copper, More Zinc

➤ THE NEW copper penny, scheduled for production on Jan. 1, will contain slightly less copper and a little more zinc than the traditional "copper." Whereas the old coin was made of 95% copper and 5% zinc and tin, the new coin will contain 85% to 90% copper and 10% to 15% zinc. It will weigh a trifle less than the standard bronze coin and will be similar in appearance.

The Mint will use as a base for the new cent small-arms cartridge cases recovered by military authorities from proving grounds, firing ranges and other training areas for troops. These cases contain 70% copper and 30% zinc, to which will be added enough virgin copper to bring the copper content up to the required amount. The old cases will be melted at the Mint for use.

Due to a shortage of pennies, the 1943 zinc-coated steel penny will remain in circulation and continue to annoy Mr. Average American until it becomes sufficiently discolored with use.

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RESOURCES

More Fish Are Needed To Meet Wartime Demands

➤ MORE and more fish for food for the armed forces, civilian population and for our allies is being demanded by the government. The Federal Coordinator of Fisheries is trying to help the fishing industry step up the catch by supplying additional manpower, boats and equipment, the shortages of which were largely responsible for the light catch of 1942.

Manpower shortage in the fishing industry is due to the large numbers of fishermen and fishing boat crews who are in military or other government service. These men make highly desirable recruits for the Navy, Coast Guard and other services afloat. Others decided on land jobs in spite of high wages paid to fishermen because of the submarine and other wartime dangers on the oceans. The internment of Japanese fishermen on the Pacific coast added to the shortage.

Lack of boats and equipment is due to the large number of fishing craft requisitioned by the government early in 1942 for use as mine sweepers, patrol boats, and for cargo carriers to take equipment and supplies to American forces overseas and to our allies. Many of these boats have now been returned to the trade, but before going into actual fishing they had to be re-equipped.

A figure of about 6,000,000,000 pounds of fish and shellfish is set for a 1943 goal. This is a step-up of about 50% over 1942 production and 25% over normal. Whether or not the goal will be met is as yet uncertain, as approximately 75% of the annual catch is made in the second half of the year.

In pre-war days the value of America's annual catch of sea products amounted to nearly $75,000,000. This included commercial products from oceans, lakes and rivers. Oysters and tuna taken each year had a value of over $8,000,000 each. Other fish and shellfish, with more than a $2,000,000 value to their respective annual catches, are sardines, salmon, shrimp, haddock, flounders, clams, cod, crabs, lobsters, mackerel and halibut.

Science News Letter, November 13, 1943

GEOLOGY

Five Lava Blisters Appear In Paricutin's Basin

➤ FIVE BLISTERS of eruption have broken out in the basin of Mexico's volcano, Paricutin, just as when Jorullo volcano, 67 miles west of Paricutin, burst forth in 1759 it also produced 19 similar formations.

As yet it is undetermined whether the little craters are openings in the lava flow with the molten material coming down under the surface of the volcano's main cone or whether they are real craters reaching down into the earth.

Visitors at the edge of Paricutin's basin described the change in the volcano's activity as spectacular. This development was not unexpected to geologists studying the volcano, and Dr. Ezequiel Ordonez had published a prediction of this possibility.

Science News Letter, November 13, 1943

CERAMICS

Pottery Made Successfully With Paricutin's Lava

➤ PARICUTIN, Mexico's volcano, as it ruins valuable farming land with its volcanic dust and lava, may be producing raw material for a new Mexican ceramics industry.

The pottery factory of the Anfora Company has just completed successful experiments with four tons of Paricutin lava, with the conclusion that it can be used in making pottery.

Science News Letter, November 13, 1943

IN SCIEN

ORDNANCE

Three Weapons Devised To Fight "Tiger" Tanks

➤ THE CHALLENGE of Germany's much-publicized 62-ton "Tiger" tanks has been met by American ordnance designers—and they have given not merely one answer, but three, all of them emphatic and conclusive.

What these answers are, Brig. Gen. Hermon F. Safford of the Ordnance Department, U. S. Army, discusses in an article in the technical journal, *Army Ordnance*. (November-December)

Two of the effective defenses against the thick-crusted Nazi monster are adaptations of already existing weapons to the new demand; the third was specially devised for the purpose. The first was the mounting of the standard 105-millimeter field howitzer on a lightly protected, fast tank chassis. This is the tank destroyer officially designated as M7 and nicknamed "the priest" by soldiers in General Montgomery's army. The second is the long-barreled 90-millimeter gun, primarily intended for anti-aircraft purposes but capable of being depressed to a low enough angle to send its terrifically high-velocity projectiles against ground targets.

The third and clinching answer to the "Tiger" is the M10 tank destroyer, which mounts a high-velocity three-inch gun in a turret with full-circle traverse. Although this gun is smaller than either of the others, it was designed especially for anti-tank work, and has such a punch that one hit from it will destroy a "Tiger" or any other known tank.

Weapons like these have been made possible by the ingenuity and high productivity of American industry. As examples of the latter, General Safford cites two changes in the use of critical materials. In one, substitution of pressed steel for machined bar stock in making one small part of an artillery shell, on one order alone, has saved 210,000 man-hours and enough steel to produce 1,500 blockbuster bombs. In the other, change-over from brass tubing to steel stamping in the making of primer tubes has effected a saving of 30,000 tons of brass—enough to provide all the brass needed in building 184 destroyers.

Science News Letter, November 13, 1943

CE FIELDS

FORESTRY

Mechanized Tree Feller Invented in the Bronx

➤ PAUL BUNYAN and the mighty men of his camp may well heave ghostly sighs, as they repose beneath the whispering hemlocks of the lumberjack's Valhalla. A mechanized monster, powered by a prosaic diesel engine, promises to outdo their most tremendous legendary feats of clearing timber—and it's the invention of a city man at that.

The newly patented machine is a tractor-mounted tree-feller, the device of Zygmunt Pehel, who lives in the Bronx. Forward from the front end of its massive frame projects a stout, derrick-like boom, raised and lowered by means of a pneumatic or hydraulic cylinder and piston mounted toward the rear.

At the outer end of this boom is a circular saw, powered from the engine. It operates within a half-collar armed with strong, bent band springs that help hold it steady against the tree trunk it is cutting down. The adjustable boom permits the cut to be made at any desired height, and after the tree has fallen the saw may be turned at right angles to remove larger limbs and cut the trunk into short logs if desired. Finally, the boom can be operated as a kind of derrick to lift and load the logs onto trucks or flatcars.

Patent 2,332,526 has been issued on this invention.

Science News Letter, November 13, 1943

SAFETY

Ten Commandments For Safety in Hunting

➤ HUNTING accidents should be fewer this year than for many years past. Ammunition is scarce for such purposes, transportation is difficult, and hundreds of thousands of sportsmen are in uniform and hunting a different kind of game. Meat rationing, however, will probably lead many, including some new to hunting, to try this season to bring home from forest and field some additions to the family meat supplies. For them and for any old-timers who may have grown careless through the familiarity that breeds contempt even for guns, the Remington Arms Co. gives the following "Ten Commandments of Safety in Hunting":

1. Treat every gun with the respect due a loaded gun. This is the cardinal rule of gun safety.
2. Carry only empty guns, taken down or with the action open, into your automobile, camp and home.
3. Always be sure that the barrel and action are clear of obstruction.
4. Always carry your gun so that you can control the direction of the muzzle even if you stumble.
5. Be sure of your target before you pull the trigger.
6. Never point a gun at anything you do not want to shoot.
7. Never leave your gun unattended unless you unload it first.
8. Never climb a tree or a fence with a loaded gun.
9. Never shoot at a flat, hard surface or the surface of water.
10. Do not mix gunpowder and alcohol.

Further advice is to dress suitably, taking special care to wear stout, wetproof boots or shoes that will help maintain sure footing on uneven or slippery ground.

Science News Letter, November 13, 1943

ORDNANCE

Tanks Given Rides To and From Battle

See Front Cover

➤ WOUNDED TANKS, like wounded men, need help if they are not to perish wretchedly on the battlefield. They now have their own ambulance, in a new, suitably massive carrier, officially designated as Tank Recovery Vehicle, M-25. It consists of a many-wheeled, low-bedded trailer, hauled by a prime mover whose bullet-proof plates and anti-aircraft machine gun give it something of the appearance of a tank itself. One of these is shown in action in the official U. S. Army photograph on the cover of this SCIENCE NEWS LETTER. A power winch and cable haul the injured tank aboard, and the "ambulance" rumbles away to where Ordnance repair men await, with their oxyacetylene-torch surgery.

Just as is the case with the Army's man-carrying vehicles, the M-25 does not go up to the battle line empty. Until it is needed for the rescue of battle-damaged tanks, it hauls fresh ones up toward the front. This enables them to enter action with fuel tanks full, engines unheated, crews unwearied.

Science News Letter, November 13, 1943

ELECTRONICS

Electronic Instrument Indicator Aids Pilots

➤ AIRPLANE pilots can now have an automatic electronic assistant in the cockpit with them to keep tab on the formidable battery of instruments necessary for modern flying.

The flightray, new electronic multiple instrument indicator, explained to the Institute of Radio Engineers in New York by F. Q. Gemmill, Sperry Gyroscope Company product development engineer, utilizes a cathode-ray tube to present vital flight information through the motion of four simultaneous and distinctive traces.

The deviation of an instrument from the desired reference condition as set by a control knob causes the associated trace to move from its normal zero position, thus warning the pilot of the deviation, its direction and relative magnitude.

Each of the instruments—directional gyro, gyro horizon, air speed indicator, altimeter and cross pointer meter—is equipped with an electrical pickup whose output voltage after amplification and rectification controls the movement of one of the four traces. Through commutation and persistence of vision the four traces projected on the screen of the cathode-ray tube appear as though they were continuous.

The numerous instruments and controls in the cockpit of the modern aircraft place a staggering burden upon the pilot, Mr. Gemmill said. While relief can be obtained through automatically operated devices and division of duties among a larger crew, coordination of necessary flight information through a single indicating instrument is a new approach to this problem.

The flightray has been under development by the Sperry Gyroscope Company for some time.

Science News Letter, November 13, 1943

ORDNANCE

Motor Torpedo Boat Has Tubes Built Into Hull

➤ A DESIGN for a motor torpedo boat on which patent No. 2,333,139 was issued to F. L. Alix of Kenmore, N. Y., has a pair of forward-pointing torpedo tubes built directly into the hull instead of being mounted on deck as in most present craft. Aft, the boat carries a cluster of shorter tubes from which depth charges can be dropped.

Science News Letter, November 13, 1943

PHYSIOLOGY

Adrift for Science

Officers and enlisted men who were purposely "lost" at sea gain information on how to stay alive and avoid injury. Test lasted six days and six nights.

➤ MILITARY AIRCRAFT patrolling the Gulf of Mexico 20 miles out of Tarpon Springs, Fla., spotted two rubber life rafts drifting in the waters below them. To all appearances the rafts were occupied by the survivors of a crash landing at sea. In reality, the men were officers and enlisted men who had volunteered to test the life rafts, equipment and rations furnished as emergency equipment on bombardment airplanes of the Army Air Forces. The test lasted six days and six nights, and the information gained by these men throws new light on the problems of survival at sea.

The test was under joint supervision of the Flight Control Command, Winston-Salem, N. C., and the Medical Branch of the A. A. F. School of Applied Tactics, Orlando, Florida. The test took place last summer (*See SNL, July 31*). It is now possible to give details of the objectives and results. The objectives were:

1. To learn whether it is best to drink large quantities of water prior to being cast adrift.
2. To determine the advantages or disadvantages of keeping the clothing saturated with sea water in an attempt to conserve body fluids.
3. To find the relationship between such factors as exercise and exposure to the sun and the rate at which the body dries out.
4. To compare the advantages of drinking large amounts of water after prolonged dehydration with hoarding water collected and drinking small amounts of it at more frequent intervals.
5. To test the effectiveness of various sunburn lotions and creams.
6. To determine the desirability of including certain items of diet now provided as emergency rations.
7. To determine the practicability of all equipment in the life raft kits.
8. To provide a source of information based on practical experience for teaching purposes.

At 4:30 on a Sunday afternoon nine officers and enlisted men, wearing light flying suits, fatigue hats, socks and shoes, went overboard from the Army Crash Boat P-269 into the two life rafts. For the next 135 hours, or until approximately 6:00 a. m. the following Saturday, all but one of these men remained constantly on the rafts, except for short periods on board the attending crash boat where daily medical studies were made. This presented an excellent opportunity to study both the equipment and the physical and mental reactions of the men on board the rafts.

Rain Drenched Them

During the first night, five men occupied the five-man raft and four men the seven-man raft. Throughout the night rain and wind kept the rafts and their crews constantly alert and continually drenched with sea water. Sleep was impossible for anyone. After the first few hours of wind, rain and heavy seas, one of the four men on the seven-man raft became so violently seasick that he had to be taken off the raft.

This man lost eight and one-half pounds during the night and went into fairly severe shock, so that neither his pulse nor his blood pressure were obtainable at times. He also became disoriented and confused. From his experience it became quite evident that seasickness can become severe enough while adrift on a life raft to result in death.

The next morning, inspection of the kits fastened to the floors of the life rafts showed that because of the lack of water-tight closures on the kit containers, almost half of the equipment was ruined and had to be discarded. Signal flares were soggy and unusable, the first-aid kit was completely soaked in sea water, the Very pistol was badly rusted as was a .45-caliber automatic pistol placed in the five-man raft kit for safe-keeping, and the rubber patching kit was so badly water-soaked that it could not have been used to repair even a small puncture or rip in the raft.

TARPAULIN CANOPY—Results of tests carried out by nine Air Force men showed that those who did not rig up over them some sort of covering to protect them from the blistering rays of the sun felt the effects of dehydration considerably more than the men on the covered raft.

The Rubber Plant

with roots two miles deep!

THE MAKING OF synthetic rubber involves among other things the exact control of gas mixtures of great complexity. Formerly the analysis of some gases required several days of painstaking laboratory work, and in some cases a complete analysis was impossible.

Westinghouse scientists—working in close collaboration with engineers of leading oil and chemical companies—have perfected an electronic "chemist" which is an important addition to the present methods of analysis.

With the improved technique and apparatus now available, the time required for accurately making some of these analyses has been reduced *to an hour or less!*

An amazing electronic device . . . known as the* mass spectrometer *. . . not only improves the accuracy of the synthetic rubber process, but frees hundreds of skilled chemists from tedious but important production testing in these vital plants.

The mass spectrometer analyzes gases by sorting the molecules—according to their mass—in (roughly) the same way that a cream separator sorts out the cream from whole milk.

Let's say we want to analyze a simple gas mixture containing *one part* of oxygen and 10,000 parts of nitrogen. Here's how the mass spectrometer accomplishes this incredible feat:

First, the gas sample is bombarded with electrons. This *ionizes* the nitrogen and oxygen molecules, giving them electrical charges of their own.

These ions are then drawn by electrical force into a curved vacuum tube. Here, ions of different molecular weights whizz around *different curved paths*—depending upon their reaction to a powerful electromagnet surrounding the tube.

The heavier oxygen ions follow a straighter path than the lighter nitrogen ions and are directed through a tiny exit slit onto a plate where they give up their electrical charge. The amount of this charge, amplified and recorded by sensitive electrical instruments, is an extremely accurate measure of the *quantity of oxygen* in the gas mixture.

The starting voltage is then changed to allow the nitrogen ions to pass through the same exit slit—thus measuring the *quantity of nitrogen*. This same principle applies to the analysis of complex hydrocarbon mixtures.

The development of the mass spectrometer . . . for the quick, accurate analysis of butadiene . . . is a typical example of the way Westinghouse "know how" in electronics is tackling the wartime problems of industry in an effort to speed victory.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania.

Westinghouse

PLANTS IN 25 CITIES OFFICES EVERYWHERE

MORAL for aviators: Inspect the life-raft kit in your airplane and place flares, first-aid kit, and any other pieces you feel may be ruined by salt water, in waterproof bags. If you can get them, water-proof icebox bags will do nicely. Grease your knife, Very pistol and automatic before every long over-water flight.

Because of the extreme crowding, with five men on the five-man raft, two of the five men moved to the seven-man raft the following morning; and for the rest of the test three men occupied the five-man raft and five men the seven-man raft.

Duties Were Assigned

To make the test as complete as possible various duties were assigned to each man. Throughout the following day the men on the five-man raft attempted to protect themselves from the sun by stretching a tarpaulin over the raft, while the men on the seven-man raft had no such protection. As a result, by the end of the day, the men on the seven-man raft were feeling the effects of dehydration considerably more than the men on the five-man raft.

MORAL: Use oars, sail and/or tarpaulin, yellow side up, to rig a canopy over the raft. Besides protecting you, it will make the raft easier to see.

During the first 24 hours, none of the men had either food or water. After that, seven of the eight men were given a reduced ration of one standard K ration box and about two-thirds of a pint of water a day, while the eighth man continued to do without food or water for four days and four nights. This last man, a 38-year-old officer, experienced no great hunger or thirst after the initial period of accommodation to conditions, indicating that with proper personal discipline even a considerably longer period of fasting is possible for anyone in good physical condition.

MORAL: When you have no water, don't eat dehydrated or dried heavy foods.

Before going on the raft, this officer had fortified himself by drinking large quantities of fluids—the total equal to more than three times his usual daily consumption. To this, and the fact that although an inveterate smoker he stopped smoking when he got aboard the raft, he attributed his lack of any great feeling of thirst for the 96 hours.

MORAL: Don't smoke if you have no water, and force yourself to drink all the liquids you can hold before and during all long overwater flights.

On the third day, two of the men became so completely dehydrated that an additional water ration became necessary. The men were weak and mentally confused. Each was given two quarts of water, which he drank within an hour. Contrary to general belief, they experienced no feeling of nausea but quite the reverse—a feeling of renewed strength and a brighter mental attitude. A careful medical check of these men during the next 36 hours showed that they retained most of the water taken.

MORAL: If you collect rain water, immediately drink as much of it as you can comfortably hold. The body can store water and it makes a far better container than a bailing bucket or a tin can. Store the rest, preferably in the regulation water cans already emptied. Some of the water taken in large quantities when you are dehydrated is lost through perspiration or excessive kidney excretions. However, a quart of water in your body is worth several stored where they may be lost if the raft tips over or spoiled by sea spray and salt.

For the duration of the test, one man kept his clothes continually wet with sea water and at the same time kept himself out of the sun as much as possible. Without any greater feeling of thirst than the rest of the men, he was able to exist with considerably less than the regular daily ration of water.

Clothes Should Be Kept Wet

MORAL: In shark-free waters in warm climates during sun-up hours, dunk yourself, clothes and all, periodically. Lower yourself over the side slowly to keep your face and mouth out of the sea water. Don't exert yourself by swimming. If one's general condition precludes dunking, the clothing may be splashed with sea-water instead.

During the third and fourth days, two men who had had little previous fishing experience were detailed to test the life-raft fishing kit. They were handed the kit and given no further instructions. Selecting the largest hooks and lines, they fished for several hours. Result: No fish. It was then suggested to them that they try the smaller hooks and pork-rind bait provided in the kit. Within 20 minutes, a small fish was hauled aboard. This was then cut up for bait and used on the larger hooks. Within an hour, two 10- or 12-pound fish had been caught.

MORAL: Don't go after the big fish first. Catch small ones with small hooks baited with pork-rind and cut up the small fry for baiting the larger hooks. Don't try to hook excessively large fish, they will only break the line and run off with your hooks and bait.

Medical examinations made before, during and after the test showed total weight losses ranging from one to ten pounds with the average loss somewhat over a pound a day for each volunteer during the six-day period. The thinnest men at the start had lost the most at the end, the fattest the least.

Few Physical Changes

Except for a general weariness and mental fatigue, there were few changes physically in the men. A comparison of the results of the physical examinations for flying given before the start of the test and those given at the conclusion showed only minor variations.

Circulatory systems showed no evidence of deterioration. The eyesight of all volunteers remained normal in spite of the daily exposure to wind and sun.

The greatest single factor contributing to the general weakness which first evidenced itself on the second day was the inability to get comfortable enough in the rafts for restful sleep. The best position was found to be crosswise with the men alternating feet first and head first, but even in that position it was difficult to sleep for more than a half to three-quarters of an hour at a time.

Out of the test also came a number of suggestions for additions and changes in the life-raft rations, medical kit and equipment kit.

Science News Letter, November 13, 1943

Magnesium production in the United States has increased nearly a hundredfold over the 3,000 tons produced in 1938, principally for use in airplane construction.

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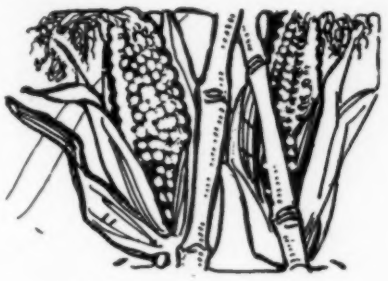
AGRICULTURE

NATURE RAMBLINGS

by Frank Thone



Beneficial Disasters

➤ DISASTERS that overtook American agriculture a decade ago had much to do with our preparedness for the present emergency on the food front.

For most city dwellers, the droughts of the mid-thirties have faded to disagreeable memories, like bad dreams we had last month. The weatherman remembers—he and the farmers. It was the first time in living men's memories that the Corn Belt had to write "failure" at the foot of the column when the year's crop was totaled up.

With the drought and heat came two insect plagues—grasshoppers and chinchbugs. Grasshoppers ate anything they could get a bite on. Chinchbugs attacked only grasses and grains, but they devastated field after field of oats, wheat and corn.

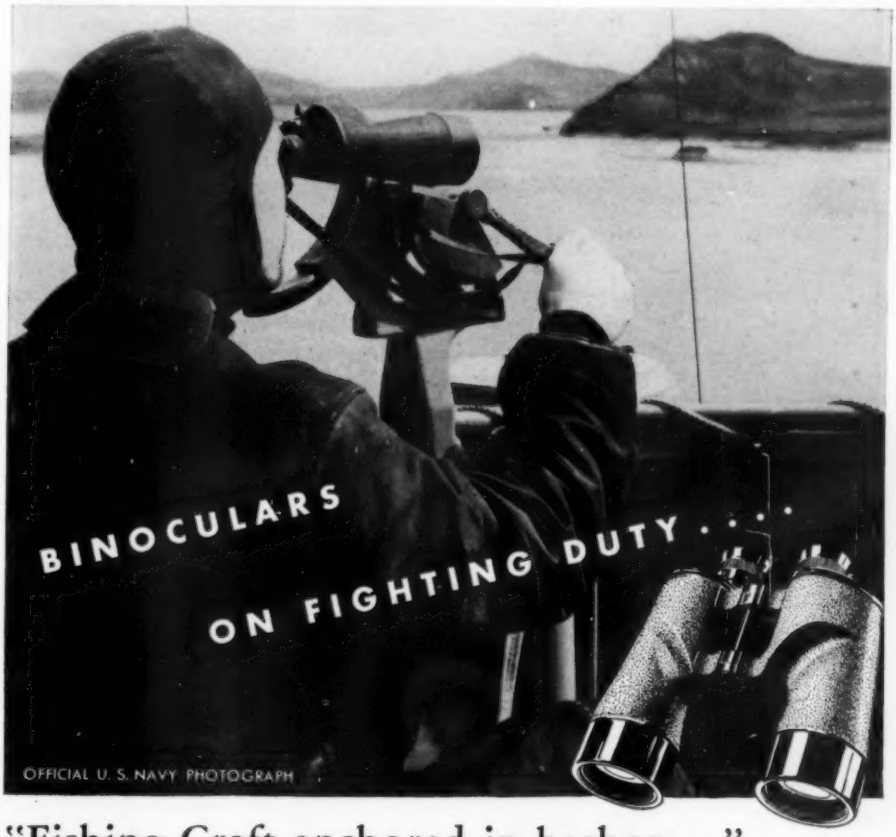
Men's eyes are sharpened by disaster. In a time when everything seems to be perishing, whatever survives is bound to be noticed. Two crops thus attracted attention to themselves. Hybrid corn, which was being adopted at a rather moderate rate by conservative farmers, stood up to the drought noticeably better than the older, more familiar varieties. Soybeans, which were also slowly making headway, were immune to the ravages of chinchbugs, and apparently were not as much sought after by the grasshoppers, either.

In desperate need for some kind of catch crop to replace the ruined fields of grain and provide feed for livestock, farmers made late plantings of soybeans for silage and hay. In one Midwestern state alone, soybean acreage increased seven-fold in the first bad drought year. And in the few following years, farmers went over practically completely to the cultivation of hybrid corn. In the crop season just closed, less than one per cent of the corn acreage in Iowa was planted to the old-fashioned varieties.

Now, in a time of urgent national need, we are getting the benefit of those blessings that came to us in such thoroughly disguised form. Hybrid corn was not bred primarily for drought resistance; that is a virtue that was almost accidentally discovered. Increased yield, permitting the farmer to retire erodible sloping lands, had been the primary objective. Farm Editor Henry Wallace estimated that it would bring a ten per cent boost in yield per acre; actually the increase has been double that, or better. And soybeans, at first grown for cattle feed and sometimes to press for oil, now become a sturdy and acceptable supplement to our war-curtailed supplies of protein food.

Science News Letter, November 13, 1943

A yearling *bear* in Montana, apparently asphyxiated, was resuscitated by artificial respiration applied by Forest Service first-aiders.



"Fishing Craft anchored in harbor . . ."

Joe Miller sees every detail of that coastal harbor—clearly, sharply. He knows that the lives of his fellow seamen depend upon the accuracy of his observations. That's why Joe is using a Bausch & Lomb Binocular—built especially for the Navy. It must provide clear images through haze and rain—it must be rugged, water-proof, dust-proof. To thousands of seamen like Joe Miller, Bausch & Lomb Binoculars are the eyes that never fail their trust.

The United States Navy urgently needs every Bausch & Lomb 6x30 or 7x50 glass available. Bausch & Lomb production is on a twenty-four hour schedule—tremendously increased over even a year ago. But there is no limit to the usefulness of these Binoculars in Navy work—there cannot be enough. So, if you have such a glass, send it to Naval Observatory, Washington, D. C., with your name and address attached. Don't delay—send your Binoculars on active duty now.

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AERONAUTICS

Big Cargo Planes Coming

Freighters of the air, carrying 38 tons of material in weather-proof packages, are predicted for the post-war world; may result in elimination of costly warehouses.

➤ HUGE CARGO planes that will each carry 38 tons of perishable and valuable freight in weather-proof packages around the globe were predicted for the post-war world by J. H. Macleod of Hinde & Dauch Paper Co., speaking before the air cargo meeting of the Society of Automotive Engineers in Chicago.

The biggest benefit for the manufacturer would be the partial or entire elimination of costly warehouses, Mr. Macleod declared.

Reduction in air cargo freight rates, development of global skyway shipping routes and methods, and the availability of packages protecting every type of merchandise, will bring about tremendous post-war changes in business methods, Mr. Macleod predicted. Package engineers, he added, have developed not only corrugated boxes, thereby solving a majority of air cargo shipping problems, but have assured tailor-made packaging by means of special corrugated boards, coating materials, and adhesives with tough, flexible corrugated material used simultaneously to wrap and to pack.

Air-freighting of Lend-Lease and war material has resulted, he stated, in the production of new bag packing or overwrapping materials of laminated papers and cellophane bags which control temperature and humidity, prevent corrosion, mold formation, and insect infestation. With air cargo on a global basis after the war these methods will be utilized to transport fruits, vegetables and all types of machinery to every corner of the world, Mr. Macleod declared.

Science News Letter, November 13, 1943

Air Freighters in Arctic

➤ FLEETS of air freighters spanning the isolated Arctic regions and making possible a vast development of valuable natural resources hitherto unscratched was predicted for the post-war world by W. L. Brintnell, Canadian aircraft executive, speaking before the air cargo meeting of the Society of Automotive Engineers in Chicago.

"The aviation industry as a whole," Mr. Brintnell said, "is thinking entirely of large passenger aircraft for global air routes. Few realize the tremendous importance of the development of an air freighter to operate from developed combination airports into the hinterlands of the world."

In these wildernesses of the far North, he said, lie vast, untouched natural resources, such as rich radium and gold mines.

Military planes converted to commercial use after the war, Mr. Brintnell declared, will not be practical for such air cargo work as the cost of operating them will be prohibitive. The type of air freighter needed for Arctic operations must be a reasonably fast, cheap, adaptable plane with a long cruising range and a large payload, requiring a minimum of maintenance and operating with a high degree of reliability in temperatures from 120 above zero to 70 below.

A new type of engine, one burning fuel oil, was suggested as a more economical power plant than the present-day gasoline-type engine.

Science News Letter, November 13, 1943

PLASTIC MANIKIN — Airplanes, clothing and other equipment for the fighting forces will in future be designed around models such as the one shown above in order to increase the comfort and efficiency of our soldiers and sailors of the sky. The manikins, with joints engineered to reproduce the action of the flyer's body, were molded to millimeter tolerances for accuracy from measurements taken from several thousand AAF cadets. The molding was done by a process developed by G. W. Borkland (right), sculptor, designer and president of the General Plastics Corporation, with the cooperation of Col. O. O. Benson and his staff of the Aero Medical Section, U. S. Army.

ENGINEERING

Ailerons With Hinges On Plane Wings Eliminated

➤ MEANS for fairing ailerons into the wings of a plane, instead of mounting them separately as is done at present, is the basis for patent No. 2,333,482, granted to Zeno Littman of New York. The skin of the wings fits snugly though slidably over the aileron base, eliminating the drag-creating gap inherent in the conventional hinged arrangement. Furthermore, the structure of Mr. Littman's aileron is flexible, so that when it is pulled into the depressed position the camber or curve of the trailing edge of the wing at that point is actually increased. This is reminiscent of the warping wing-tip of the first Wright planes.

Science News Letter, November 13, 1943

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❁ *FLEXIBLE rubber-like plastic materials recently developed are used in handling toluol, xylol and benzol which give the new super-gasolines their tremendous power. Connection hoses, protective gloves and aprons are made of these materials, claimed to be the most solvent-proof rubber substitute yet developed.*

Science News Letter, November 13, 1943

❁ *STEEL and rubber, bonded by a new agent and process, are almost inseparable. By the same process metals may be firmly bonded with wood, leather, plastics and other metals. The surfaces are coated with the bonding material. After drying, mild heat and pressure are applied.*

Science News Letter, November 13, 1943

❁ *WASHING MACHINES of a type recently patented operate by forcing suds into the clothes, the pressure agitating the clothes at the same time. The suds are kept in constant circulation by an electric pump operating under a false bottom.*

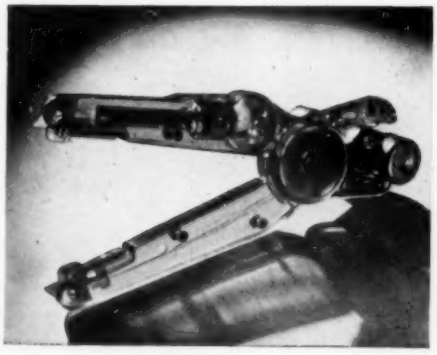
Science News Letter, November 13, 1943

❁ *COAT HOOKS, made of a thermo-setting plastic by injection-molding, are replacing metal hooks on Navy boats. After the war they will be available for civilian uses in colors to harmonize with room finishes.*

Science News Letter, November 13, 1943

❁ *PLASTIC PLIERS are used to pull and test fuses in munition and other plants and also in the armed services. Transparent plastic permits the user to observe a small enclosed bulb which lights up when a good fuse is checked. The picture shows a pair of these pliers.*

Science News Letter, November 13, 1943



❁ *DOUBLE-EDGED razor blades are quickly sharpened with a small abrasive block slightly hollowed lengthwise. A shelf and guard in the center prevent sidewise movement while the blade is pushed forward and back. A patent has just been issued.*

Science News Letter, November 13, 1943

❁ *QUICKLY REMOVABLE boots are laced in the rear to adjust them to fit the legs. Each boot has two zipper openings in the front; the extra or emergency one opens by pulling the zipper upward. Parachutists wearing these patented boots can shed them easily if they are landing in deep water.*

Science News Letter, November 13, 1943

❁ *MACHINERY and machine tools may now be coated with a new "pebble" finish which is applied without fillers, sanding and numerous coats of sealing paint. Much time is saved by the use of this finish, which is sprayed or brushed on.*

Science News Letter, November 13, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 182.*

GEOLOGY

Mexican Murder Pit Only 500 Feet Deep

➤ TASCO'S MURDER pit, known as Hell's Mouth, is a mere 500 feet deep, as determined by explorations by Mexico's leading geologist, Dr. Ezequiel Ordonez.

Although relatively shallow compared with its rumored mile extent (*See SNL, Oct.* 30) into the ground, governmental authorities determined that it should be dynamited so as to close it and prevent its use as an illegal execution spot.

The destruction of the pit was undertaken by two engineers, Cornelius Crosby, American connected with the zinc and lead mines nearby, and Saul Mora, a Mexican engineer. Mayor Bernabe Rios, of Tasco, authorized the demolition at a cost of about $500.

Legend has it that pre-conquest Indians and early Spaniards threw their enemies into the pit, and recently murders have been committed in Hell's Mouth.

Dr. Ordonez in his geological explorations found that the deep pit consists of a limestone rock layer over granite and that it is a good example of the rock strata that run from Mexico City to Acapulco.

Science News Letter, November 13, 1943

MEDICINE

Skin Care Important For Workers in Industry

➤ THE SKIN of a war worker is just as important and should be given just as good care as the skin of a stage or screen star. Skin that is rough, cracked and has little cuts on it is not only unsightly but may be dangerous to health because it provides such an easy way for germs, dirt and irritating chemicals to get into the body. Time taken to cleanse the skin and to put on protective gloves, sleeves and the like is time well spent and may save a far greater amount of time from being lost because of skin trouble.

A man or woman with hands swollen by skin disease can no longer do precision work and such disability presents a tremendous obstacle to the smooth production of tanks, planes, motors, guns, small arms, munitions and explosives, Dr. Louis Schwartz, U. S. Public Health Service expert on industrial skin diseases, points out.

Dirt, he warns, plays an important part in prolonging skin diseases and cleanliness is important for preventing them. The lesson is one we all should learn, but men and women workers in war plants who have never worked in factories before need particularly to learn this for their own protection and for the war effort.

Industrial skin disorders are more apt to attack the new worker, Dr. Schwartz warns, because older employees learn the hazards of their particular trade and how to avoid them.

In many plants the foreman, doctor, nurse or perhaps the safety director will tell new employees about any special hazards and how to guard aginst these. Workers should remember to follow these directions which are based on scientific studies of prevention of skin disease.

Besides being careful to keep their skin clean, workers may need to learn the proper way to do this. Many workers blame their work for their skin eruptions when the condition actually has been caused by the harsh methods or materials used to clean hands and bodies after work.

Science News Letter, November 13, 1943

First Glances at New Books

➤ SELDOM does science on its broad front parade before your eyes as it does in A TREASURY OF SCIENCE, edited by Harlow Shapley, Samuel Rapport and Helen Wright (*Harper*, $3.95) with its more than a hundred excerpts from significant and readable science expositions of recent and early times. Dr. Shapley in his introduction explains that this is an attempt, as well as paper and ink can do, to have readers share in the conquests of science. First, science, scientists and their aims and methods are presented, then the physical world with its heavens, earth, matter, energy and physical law. Then the world of life and next the world of man, which includes the conquest of disease. Man's mind and man's future are the final sections.

Science News Letter, November 13, 1943

➤ MEDICAL PROGRESS within the last 100 years has been so enormous that to chronicle all of it in a single book would probably result in little more than a catalogue. C. D. Haagensen and Wyndham E. B. Lloyd, authors of A Hundred Years of Medicine (*Sheridan*, $3.50), have chosen to tell the story by describing and explaining the advances which in their opinion were most important and interesting. A brief description of the state of health and medicine 100 years ago backgrounds the main part of the book.

Science News Letter, November 13, 1943

➤ GLOBAL WARFARE emphasizes the fact that large portions of the world's populations are in an abnormal mental condition. Those interested in authoritative statements regarding many of the mental ills to which man is heir will welcome CONTEMPORARY PSYCHOPATHOLOGY (*Harvard Univ.* $5) gathered from the writings of fifty-four psychologists and psychiatrists edited by Silvan S. Tomkins.

Science News Letter, November 13, 1943

➤ WEATHER AROUND THE WORLD is of particular interest at the present time with American soldiers and sailors scattered so widely over the earth. The book describes the weather in 185 key places. It contains many illustrations, charts and maps. There are also descriptions of winds, waves, clouds, ocean currents, waterspouts and all other weather phenomena. The author, Ivan Ray Tannehill, is an official of the U. S. Weather Bureau. (*Princeton Univ.*, $2.50.)

Science News Letter, November 13, 1943

➤ PLYWOODS by A. D. Wood and T. G. Linn is the story of the development, manufacture and use of this relatively new construction material. It is a textbook for the plywood trade and will prove of value in vocational schools. (*Chemical Pub.*, $4).

Science News Letter, November 13, 1943

➤ FIRE, and what it has done to some of our American forests. A tragic but dramatic story of our valuable timberland, BURNING AN EMPIRE, by Stewart H. Holbrook (*Macmillan*, $2.50), gives an account of the historic forest fires which have scarred our land. He leaves us with the question of how to prevent these destructive fires. The causes and the answer—carelessness—sadly enough, we all know.

Science News Letter, November 13, 1943

• Just Off the Press •

THE ABC'S OF RADIO—*General Electric*, 68 p., illus., 25c. This book is intended to help the beginner understand the fundamentals of radio.

A. S. T. M. STANDARDS ON PETROLEUM PRODUCTS AND LUBRICANTS — *American Society for Testing Materials*, 442 p., illus., $2.25.

ARTS AND CRAFTS: A Practical Handbook—Marguerite Ickis—*A. S. Barnes*, 309 p., illus., $2.50.

THE BIGGEST BEAR ON EARTH—Harold McCracken—*Frederick A. Stokes*, 114 p., illus $2. A book for young people.

BURMA—GATEWAY TO CHINA—H. G. Deignan—*Smithsonian Inst.*, 21 p., illus., free upon direct request, War Background Studies No. 17.

CLINICAL AUDIOMETRY—C. C. Bunch—*C. V. Mosby*, 186 p., illus., $4.

EARTH SCIENCE: A Physiography—Gustav L. Fletcher—*D. C. Heath*, 583 p., illus., $2.20, rev. ed. A textbook for secondary schools.

THE FOOD RESOURCES OF AFRICA—Thomas S. Githens and Carroll E. Wood, Jr.—*Univ. of Pa.*, 105 p., illus., $1.50. This is the third of a series of African Handbooks.

GARDEN ISLANDS OF THE GREAT EAST: Collecting Seeds from the Philippines and Netherlands India in the Junk "Cheng Ho" —David Fairchild—*Scribner*, 239 p., illus., $3.75.

HAMMOND'S AIR AGE MAP OF THE WORLD: A Polar Projection—*Garden City Pub.*, 50c.

HEALTH INSTRUCTION YEARBOOK 1943—Compiled by Oliver E. Byrd—*Stanford Univ. Press*, 308 p., $3.

HIGHER EDUCATION IN LATIN AMERICA: VOL. 1 ARGENTINA—Edmundo Lassalle—*Pan American Union*, 118 p., 50 c., paper.

MANOMETRIC METHODS: As Applied to the Measurement of Cell Respiration and Other Processes—Malcolm Dixon and F. G. Hopkins—*Macmillan*, 155 p., illus., $1.75, 2nd ed.

MENTAL HYGIENE IN SCHOOL PRACTICE—Norman Fenton—*Stanford Univ. Press*, 455 p., $4. The book was planned to be of practical value to teachers, administrators and interested laymen.

MOTHER AMERICA: A Living Story of Democracy—Carlos P. Romulo—*Doubleday, Doran*, 234, p., $2.50. Colonel Romulo gives a personalized story of America's relationship with the Philippines.

NAVIGATION—L. M. Kells, W. F. Kern and J. R. Bland—*McGraw-Hill*, 479 p., illus., $3.75. A college textbook.

ORGANIC CHEMISTRY—C. W. Porter and T. D. Stewart—*Ginn*, 577 p., illus., $4. The book provides material for a year's course in college organic chemistry.

RACE RIOT—Alfred McClung Lee—*Dryden Press*, 143 p., illus., $1.50.

THESE MEN SHALL NEVER DIE—Lowell Thomas—*John C. Winston*, 308 p., illus., $2. Stories of some American men of valor in our first year of war.

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